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# **Staff Development in an Interdisciplinary Education: ‘Medialogy’**

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## **Abstract**

In this paper we describe how interdisciplinarity and transdisciplinarity have been approached in the Medialogy education at Aalborg University in Copenhagen. We discuss the role of the faculty members, and what are the criteria to establish that they achieve transdisciplinarity and what enables them. In particular, we examine the possibility of having professionals which are both specialized in their field and also able to communicate and bridge towards other disciplines.

## **Introduction**

Different new programs in the field of media and technology are constantly developing worldwide. Searching on the Internet almost every university has programs in either media – or technology. Several universities also discuss the challenges to offer double degrees, so the students can combine an individual education according to their interests in media and technologies. On top of that, some universities are offering interdisciplinary educations e.g. in the field of media technology. Having worked with those interdisciplinary engineering and science educations for several years for the teachers it still seems to be a challenge to define the key competences, their aim and their ability to provide new scientific paradigms and disciplines of such educations. Furthermore the members of the different faculties’ understanding and interpretation of an interdisciplinary program is a difficult factor in development and implementation of those new educations (Nordahl, 2008).

As in many other universities new programs are designed at Aalborg University combining engineering and science with humanities and social science. As an example, the Medialogy program, which is an education where technologies and media in an creative and interdisciplinary way are intertwined. Students work with information technologies (digital media) and their interactions with sound, pictures, virtual reality etc. in different possible applications. This paper recounts some of the pedagogical experiences and reflections that we have been working with in the new education Medialogy.

Those new educations call for a rethinking of the pedagogical approach. At Aalborg University all programs are based on problem based and project organized pedagogical approach (PBL). The emphasis of working problem oriented has to be much stronger to support and structure the students to work with new combinations of subjects in a creative way (Busk Kofoed and Nordahl 2008). So a first challenge is to establish a curriculum based on PBL as a strong basis for the learning environment. A second challenge for those new educations is the need for the faculty members to understand and act with their specific expertise in an interdisciplinary environment. The faculty members have different backgrounds ranging from the hardcore engineers to hardcore social science people as well as staff from art and humanities, and they have to get a mutual understanding of the Medialogy program, goal and content. The focus in this paper is on the faculty members and their problems connected to be in an interdisciplinary teaching and learning environment. Some of the important questions dealt with are: How do faculty members with different educational disciplines act in an interdisciplinary environment? How do they understand the interdisciplinary approach and necessity for the program? And finally how do they see their possibility for contributing to Media Technology as an interdisciplinary education? Furthermore Aalborg University use a problem based and project organized learning approach (PBL) and another question is how the faculty members apply this approach in the interdisciplinary programs.

A group of faculty members have been followed during a year, when they planned, organized, implemented and evaluated the relatively new engineering and science program: Medialogy. The methods have been interviews, obser -

vations, documents and literature studies. The results are very visible. Faculty members do after some developmental actions and time spend in the environment in general understand the PBL approach and are starting to develop this pedagogic with new ideas and experiments. Furthermore they have a good understanding of the whole curriculum and the interaction and possibilities of the different disciplines, so most of the faculty members can see their own expert contribution and show an understanding of the interdisciplinary program by applying operational aspects to the program. To each main issue faculty members have pointed out which enablers have been useful in their development.

### **Media Technology, the interdisciplinary approach and PBL**

Media Technology or Medialogy as it is called in everyday language is an education started at Aalborg University in September 2002. The goal of the education is “to develop problem solvers in a digital media age independent of tasks” (Nordahl, 2007). This goal is achieved by merging creativity, arts and technology through the development and cross-combination of areas and topics within the field of engineering technologies, computer science, psychology, sociology and arts. Such areas have until recently been kept apart by conventional standards. The programs are structured according the study regulation with 50% lectures and 50% project work. The projects are carried out during the whole semester in groups with 7-2 students in each group except for the master thesis, where students are allowed to work individually with their projects. Classes belong to both technical as well as non-technical subjects. The distribution has been done with primary emphasis on that classes should support the projects. Secondly, in order to secure that the variety of disciplines is represented, a deliberate choice has been made so that technical and non-technical subjects get equal attention. 1/3 of the time is given to topics within Natural Sciences, 1/3 to topics within humanities and arts and 1/3 within technical subjects. Each project group has one or two teachers connected as supervisors during the semester. Normally the supervisors also are lecturing on the semester. (See study regulation 2008)

The education is concerned with the current and future needs of society, culture, industry, hardware and software. The purpose of the program is to provide students with a solid foundation in areas within new media comprising both technical and creative aspects. Students graduating in Medialogy will be able to integrate and combine different fields of new media technologies. In Medialogy, students typically are faced with questions such as: to which extent can computer games be made more interactive or to which extent can the borders between man and machines be overcome? How can colours and pictures support the deaf people to get an understanding of sound and music? Or how can an interactive program support disable kids age 7 – 14 to train their muscles?

How can sound be made tangible by mean of an untangible user interface? How can we make rehabilitation more entertaining by using alternative interfaces?

### **The interdisciplinary approach**

It is a challenge to design an interdisciplinary curriculum.(Adamczyk and Twidale 2007, Mackey 2004). Many interdisciplinary educations are merely a combined effort of different competences from several faculty members put together. The terms interdisciplinary and cross disciplinary or multidisciplinary are often used without thinking of the different distinctions. But it is important to have a clear definition and understanding of those words when being in an environment trying to establish a common understanding of a new education with a new combination of disciplines. In this paper we will use the definition proposed by Meeth in 1978, when he observed confusion in defining what an interdisciplinary education is (Meeth 1978). Meeth proposed a hierarchical classification. At the bottom he placed intradisciplinary studies i.e., studies composed of a single discipline. At the next level he placed crossdisciplinary studies i.e. studies in which one discipline is viewed from the perspective of another. Crossdisciplinary studies are relatively easy to establish according to Meeth, since they allow faculty members to remain in their own disciplines. Multidisciplinary studies are placed at the next level where each will offer their own viewpoint, but not necessarily with any integration. The next level shows interdisciplinary studies in which the attempt is to integrate several disciplines which allow solving particular problems. The highest level of integrated studies is transdisciplinary studies. This approach goes beyond disciplines, since it starts from a problem, and using problem solving, brings the knowledge of those disciplines which contribute to the solution (Meeth 1978). As also argued by Meeth, trans-disciplinary

studies are hard to design, since they require highly prepared and intellectual mature faculty members.

So one thing is to design the interdisciplinary or crossdisciplinary Mediaology curriculum which still after 5 year is in a continuous and innovative improvement process, another thing is to get the faculty members to understand and act according to such interdisciplinary curriculum. According to the study plan, students should have opportunities to achieve an interdisciplinary or crossdisciplinary competence profile as described by Meeth.

Most of the faculty members at the Mediaology program are young and have different nationalities and professional backgrounds. They are brilliant within their field and are fascinated by the possibilities of working with a new education. But most of them have had a very hard time trying to define their role in the Mediaology environment. Discussions about definitions of the above classification of interdisciplinary studies has helped quite a lot, but until recently there has been a tendency to separate in at least two groups, the – non-technical and the hard-technical, and within those two groups there have been psychological factors as uncertainty, dominance, power struggles, status of the different disciplines etc. And on top of this it has been very hard to understand the whole curriculum and the progression in the 10 semesters. Another barrier has been the cooperation between teachers e.g., connected to the same semester which could be very difficult. Each teacher had her or his class with very little or no connection to the common goal for the semester. There was even a tendency of building strong borders between the different subjects as well as a kind of power struggles was started between the technical and non-technical staff members.

Even as all faculty members have a common goal: to establish a new interdisciplinary education it appears to take an extraordinary effort for each teacher to understand the fully concept of Mediaology and to find their role in the interdisciplinary education.

Enablers have been:

- A semester coordinator taking charge and responsibility of planning the semester activities together with the teachers connected to the semester.
- Semester meetings with students discussing and evaluating different activities and aspects of the learning process as well as practical issues.
- Semester meetings with teachers discussion and evaluating the progress of the semester
- Time. Each semester give new experience and knowledge about how the Mediaology programs are designed and how different aspects of curriculum could be improved so every time a semester is finished the connected teachers had an improved understanding.

### **Problem Based Learning approach**

Our presumption is that the problem based learning (PBL) approach represents an ideal framework to design an interdisciplinary and a trans-disciplinary education in the sense defined by Meeth (1978), where trans-disciplinarity is viewed as the ability to define a problem and find the relevant disciplines which allow solving it.

Aalborg University is using the concept Problem Based and Project Organized Learning (see Kolmos et al. 2004), and an additional pedagogical challenge has been to introduce this educational paradigm for the faculty members in the development of new curricula within Mediaology.

The department of Media and Technology was new so it could be defined as a developing community of practice which was not strong enough in its own apprehension and had not developed a common sense of identity (Wenger et al 2002). This state of the department with many new teachers was one of the pedagogical problems because there was not a common understanding among the teachers about the PBL approach. So all faculty members were expected to take a pedagogical course, which is a mandatory course for assistant professors (PUC 2007). But even with this course lots of pedagogical problems occurred because of old habits from different educational cultures. Then a special workshop was held to force the teachers to work with the problems oriented part of the student's projects together with the students (Nordahl and Busk Kofoed 2008). This workshop was a success for both teachers and students to understand the nature of problem based projects, but still the faculty members did not have the genuine understanding of the education's interdisciplinary or trans-disciplinary approach. With genuine understanding we mean an understanding which might lead to action. After a year with many discussions about structure of a project based on the PBL pedagogical approach and discussions of assessment criterias the staff seemed to have reached a much better understanding of PBL.

Enablers have been:

- A common pedagogic course for all faculty members.
- Production of several documents explaining the structure of PBL projects written by different members of the faculty.
- Sharing experience about projects each semester

### **Teaching, supervising, developing, experimenting** **- Understanding medialogy**

For many staff members the challenges of developing an understanding of the Medialogy and the curriculum have been a huge task. A typical staff member has started to work at Medialogy with an excellent expertise within a specific academic area. The first thing was to find out how to use his or hers expertise according to the study regulation. The next part was to combine the expertise with the Medialogy - ideas so classes would be designed so they are not stand-alone – classes, but they have to be part of the comprehensive view and understanding of Medialogy. This was one of the difficult aspects of the staff development: to find a common understanding of Medialogy.

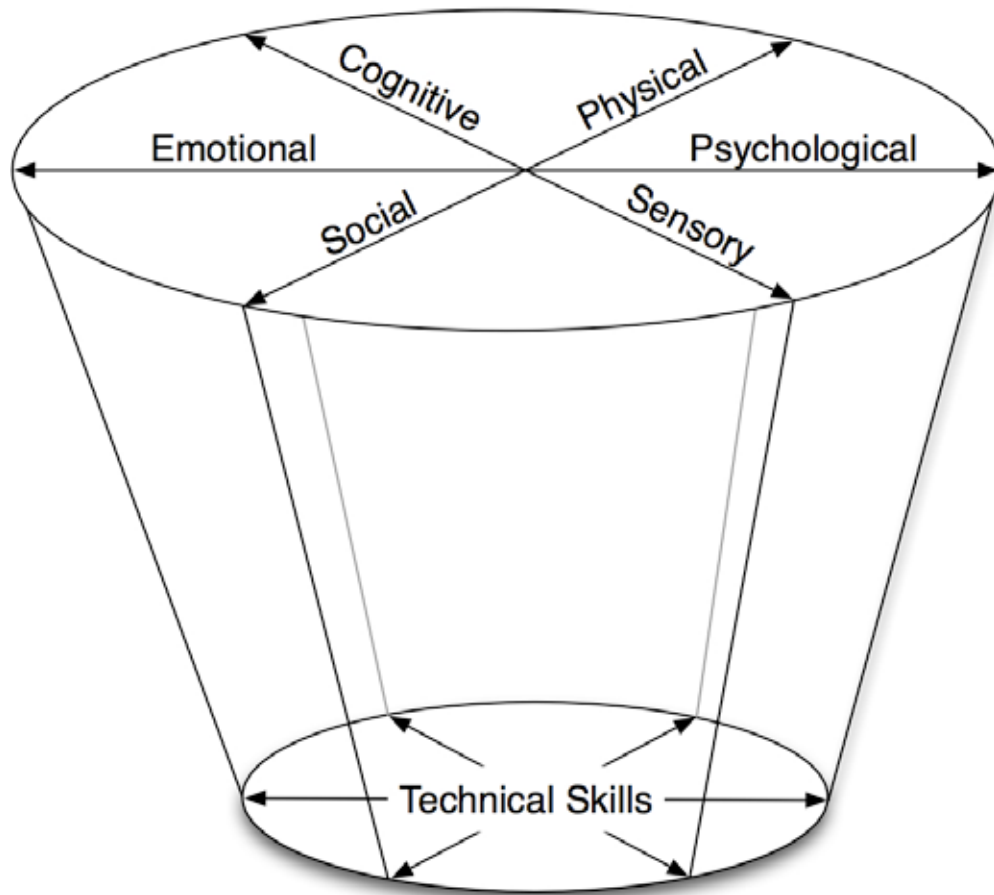
The faculty members have to get a new competence. Terry Winograd claims that to get design into effective practice, one need to train designers and also to teach the people they work with how to understand, incorporate and foster design (Winograd 2008). This philosophy is also at the heart of new programs around the world like the Stanford d.school which talks about creating T-shaped people (Institute of Design at Stanford 2007).

Such people maintain the depth and focus of single disciplines, while integrating them and adding a crossbar of process knowledge and experience that drives the integration of multiple perspectives into solving real problems.

When interviewing staff they all talk about what it takes extra to be a teacher at medialogy. It is a matter of course to know your own subject expertise by heart, but it is also important to know the connection to the other teacher's subjects or at a minimum know enough to discuss how to connect different subjects into a problem solving situation. So you are able to see how your subject fit into the palette called medialogy. It is like "...you have to be part of making a painting on a huge canvas. All shapes and colors are equally important for the final result. They support each other". (medialogy teacher). It means that the teachers have to understand how their subjects can contribute to the curriculum, but this it not always an easy task. "I need help from the other teachers. They have to feed me with medialogy examples so I can see how mathematic lessons can be used in an application which I can use as a case. When I do this I can see from the students work that I have made a teaching success". (Math teacher).

After some years where teachers were discussing the amount of technical classes and the technical content in the project vs. too much non- technical classes and too much non-technical content in the projects there is an understanding of the importance of the technical skills as a basis for being able to use the non-technical skills – to put them into actions as shown in the model below.

Fig.1 Model which show the technical skills as the foundation for bringing the non-technical skills into action.



When having the technical foundation the teachers know that the students are able to solve problems in a creative way related to new combinations within the digital media world. The teachers have designed the model and used it as a tool to understand the necessity of all three subject areas: natural science, humanities and arts, and technical subjects. Coming to this understanding has taken lots of effort and time, and a few teachers had to recognize that they did not fit into that kind of learning environment. But for the remaining staff it has been a rewarding process even when they know that there are still needs for improvements.

Enablers have been:

- Discussions, discussions and more discussions.
- Experimentation with different teaching strategies.
- Doing research together and writing publications.
- Using a common model for discussions

### Conclusion

Starting a new interdisciplinary program takes a lot of resources. The whole faculty has to be involved in the process and every level from semester coordination to the overall curriculum design has to be designed, planned and accepted of all teachers.

Teachers also have to make an extra effort to adjust to an interdisciplinary curriculum where colleagues have other traditions, which count for both teaching and research. It is important to keep developing own expertise and at the same time develop a new interdisciplinary expertise which is based on the common understanding of the new program.

The field of medialogy is a fast changing field, so the plan is still to have a meetings with the faculty members every

second week or on monthly basis. The strategy is to establish further discussions about classes and projects for each semester and show how the different disciplines can be combined, how the classes should be designed so they are part of the comprehensive view, and still which competences should be developed among teachers.

It is also important to continue the discussions of the progress according to the interdisciplinary or trans-disciplinary understanding in the group of staff, and to analyze how they might change viewpoint on their own discipline in connection with other disciplines and how they hopefully might be able to create new pedagogical strategies.

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